What is Claimed is

1. A color separating and mixing element comprising, in its transparent cube, a first optical function surface formed on a two-dividing surface for dividing the cube into two triangular prisms and a second optical function surface formed on another two-dividing surface,

said first optical function surface having the functions of transmitting both first polarized light and second polarized light which differs from the first polarized light by 90° in the direction of polarization with respect to two of lights in the three primary colors and transmitting first polarized light and reflecting second polarized light with respect to the other one light in the primary color, and

said second optical function surface having the functions of transmitting both first polarized light and second polarized light with respect to said other one light in the primary color and transmitting first polarized light and reflecting second polarized light with respect to said two lights in the primary colors.

2. A color separating and mixing element comprising, in its transparent cube, a first optical function surface and a second optical function surface which are unparallel to each other, first and second faces

of the cube being respectively taken as light incidence surfaces, third, fourth and fifth faces of the cube being respectively taken as light incidence/output surfaces, and a sixth face of the cube being taken as a light output surface,

one light in the primary color which is predetermined polarized light incident on the first face of said cube passing through the first optical function surface and being emitted from the third face of the cube, said one light in the primary color returned after the direction of polarization thereof is rotated by 90° being received in the third face of the cube, and the one light in the primary color being reflected by the first optical function surface and being emitted from said light output surface,

one, which is predetermined polarized light, of two lights in the primary colors incident on the second face of said cube passing through the second optical function surface and being emitted from the fourth face of the cube, said one light in the primary color returned after the direction of polarization thereof is rotated by 90° being received in the fourth face of the cube, the one light in the primary color being reflected by the second optical function surface and being emitted from said light output surface, and

the other one, which is predetermined polarized light, of the two lights in the primary colors incident on the second face of said cube being reflected by the second optical function surface and being emitted from the fifth face of the cube, said other one light in the primary color returned after the direction of polarization thereof is rotated by 90° being received in the fifth face of the cube, and the other one light in the primary color passing through the second optical function surface and being emitted from said light output surface.

3. A video light producing device comprising:

the color separating and mixing element according to claim 2;

three reflection type light modulating elements respectively provided on the side of the third, fourth and fifth faces of the cube of the color separating and mixing element;

a light source for emitting white light;

separation means for separating the white light emitted from said light source into one light in the primary color and two lights in the primary colors which are predetermined polarized lights; and

narrow-band retardation means for rotating the direction of polarization of one of said two lights in

the primary colors by 90°.

4. A video light producing device comprising:

the color separating and mixing element according to claim 2;

three reflection type light modulating elements respectively provided on the side of the third, fourth and fifth faces of the cube of the color separating and mixing element;

a first light source portion for emitting one light in the primary color which is predetermined polarized light; and

a second light source portion for emitting two lights in the primary colors which differ from each other by 90° in the direction of polarization.

5. The video light producing device according to claim 4, wherein

said second light source portion comprises narrow-band retardation means for rotating the direction of polarization of one of the two lights in the primary colors by 90°.

6. The video light producing device according to claim 4, wherein

said second light source portion comprises two light sources for respectively emitting two lights in the primary colors which differ from each other by 90° in the

direction of polarization, and

mixing means for receiving and mixing said two lights in the primary colors.

7. The video light producing device according to claim 3, wherein

the light source or the light source portion comprises solid-state light emission means.

8. The video light producing device according to claim 4, wherein

the light source or the light source portion comprises solid-state light emission means.

9. The video light producing device according to claim 3, wherein

polarization conversion means for converting the direction of polarization of the incident light.

10. The video light producing device according to claim 4, wherein

polarization conversion means for converting the direction of polarization of the incident light.

11. The video light producing device according to claim 3, wherein

the light from the light source is changed into two light fluxes, and

the two light fluxes cross each other on the optical function surface and are respectively introduced into a

first irradiation area and a second irradiation area of the predetermined reflection type light modulating element.

12. The video light producing device according to claim 4, wherein

the light from the light source is changed into two light fluxes, and

the two light fluxes cross each other on the optical function surface and are respectively introduced into a first irradiation area and a second irradiation area of the predetermined reflection type light modulating element.

13. The video light producing device according to claim 11, comprising

a first integrator lens comprising an incidence-side lens array and an output-side lens array such that each of convex lenses introduces the light from said light source into the first irradiation area of said reflection type light modulating element, and

a second integrator lens comprising an incidence-side lens array and an output-side lens array such that each of convex lenses introduces the light from said light source into the second irradiation area of said reflection type light modulating element.

14. The video light producing device according to

claim 12, comprising

a first integrator lens comprising an incidence-side lens array and an output-side lens array such that each of convex lenses introduces the light from said light source into the first irradiation area of said reflection type light modulating element, and

a second integrator lens comprising an incidence-side lens array and an output-side lens array such that each of convex lenses introduces the light from said light source into the second irradiation area of said reflection type light modulating element.

15. The video light producing device according to claim 11, comprising

a mechanism for adjusting the angle of irradiation of the light flux.

16. The video light producing device according to claim 12, comprising

a mechanism for adjusting the angle of irradiation of the light flux.

17. The video light producing device according to claim 11, comprising

a mechanism for shifting the position where the irradiation of the light flux is started.

18. The video light producing device according to claim 12, comprising

a mechanism for shifting the position where the irradiation of the light flux is started.

19. The video light producing device according to claim 13, wherein

condenser lenses are respectively provided on the light output side of the output-side lens arrays, and

each of the condenser lenses is provided such that the movement thereof is adjustable in a direction perpendicular to its optical axis so that the angle of irradiation of the light flux can be adjusted.

20. The video light producing device according to claim 14, wherein

condenser lenses are respectively provided on the light output side of the output-side lens arrays, and

each of the condenser lenses is provided such that the movement thereof is adjustable in a direction perpendicular to its optical axis so that the angle of irradiation of the light flux can be adjusted.

21. The video light producing device according to claim 13, wherein

condenser lenses are respectively provided on the light output side of the output-side lens arrays, to form pairs of integrator lenses and corresponding condenser lenses, and

the pairs are provided such that the positions

thereof can be individually shifted so that an operation for shifting the position where the irradiation of the light flux is started can be performed.

22. The video light producing device according to claim 14, wherein

condenser lenses are respectively provided on the light output side of the output-side lens arrays, to form pairs of integrator lenses and corresponding condenser lenses, and

the pairs are provided such that the positions thereof can be individually shifted so that an operation for shifting the position where the irradiation of the light flux is started can be performed.

23. The video light producing device according to claim 11, wherein

the light from the light source is changed into two light fluxes by two rod integrators.

24. The video light producing device according to claim 12, wherein

the light from the light source is changed into two light fluxes by two rod integrators.

25. The video light producing device according to claim 23, wherein

there is provided a light source comprising a reflector in the shape of a curved surface, and

approximately parallel lights from said light source are condensed, and are respectively introduced into light incidence surfaces of said two rod integrators.

26. The video light producing device according to claim 24, wherein

there is provided a light source comprising a reflector in the shape of a curved surface, and

approximately parallel lights from said light source are condensed, and are respectively introduced into light incidence surfaces of said two rod integrators.

27. The video light producing device according to claim 23, wherein

there is provided a light source comprising a reflector for forming two light converging points from one light emitting point, and

light incidence surfaces of said two rod integrators are respectively arranged in the vicinity of the positions of the two light converging points of said light source.

28. The video light producing device according to claim 24, wherein

there is provided a light source comprising a reflector for forming two light converging points from

one light emitting point, and

light incidence surfaces of said two rod integrators are respectively arranged in the vicinity of the positions of the two light converging points of said light source.

29. The video light producing device according to claim 23, wherein

there are provided two light sources, and

lights from the light sources are respectively introduced into light incidence surfaces of said two rod integrators.

30. The video light producing device according to claim 24, wherein

there are provided two light sources, and

lights from the light sources are respectively introduced into light incidence surfaces of said two rod integrators.

31. The video light producing device according to claim 23, wherein

a single optical element is provided at a position on the light incidence side of said color separating and mixing element, and

the two light fluxes which arrive in a crossing shape are refracted by said optical element.

32. The video light producing device according to

claim 24, wherein

a single optical element is provided at a position on the light incidence side of said color separating and mixing element, and

the two light fluxes which arrive in a crossing shape are refracted by said optical element.

33. The video light producing device according to claim 23, wherein

an optical system arranged on the light output side in each of said two rod integrators comprises at least a first optical element for condensing light emitted from the rod integrator and a second optical element arranged in the vicinity of a light converging point of the first optical element.

34. The video light producing device according to claim 24, wherein

an optical system arranged on the light output side in each of said two rod integrators comprises at least a first optical element for condensing light emitted from the rod integrator and a second optical element arranged in the vicinity of a light converging point of the first optical element.

35. The video light producing device according to claim 33, wherein

said two rod integrators are arranged parallel to

each other, and

said optical system comprises a third optical element for refracting lights passing through said second optical element and making the refracted lights cross each other.

36. The video light producing device according to claim 34, wherein

said two rod integrators are arranged parallel to each other, and

said optical system comprises a third optical element for refracting lights passing through said second optical element and making the refracted lights cross each other.

37. The video light producing device according to claim 33, wherein

said two rod integrators are arranged unparallel to each other, and

lights passing through said second optical element cross each other.

38. The video light producing device according to claim 34, wherein

said two rod integrators are arranged unparallel to each other, and

lights passing through said second optical element cross each other.

39. The video light producing device according to claim 11, wherein

letting A : B be an aspect ratio in the reflection type light modulating element,

each of the first irradiation area and the second irradiation area is divided at a ratio of A : B/2.

40. The video light producing device according to claim 12, wherein

letting A : B be an aspect ratio in the reflection type light modulating element,

each of the first irradiation area and the second irradiation area is divided at a ratio of A : B/2.

41. The video light producing device according to claim 3, wherein

the light source, the color separating and mixing element, and the optical element leading to the color separating and mixing element from the light source are unitized.

42. The video light producing device according to claim 4, wherein

the light source, the color separating and mixing element, and the optical element leading to the color separating and mixing element from the light source are unitized.

43. A projection type video display comprising the

video light producing device according to any one of claims 3 to 42.